SAR – Species At Risk

User's Manual

Version 2.2, December 2007

Williamson's Sapsucker (bird)
Photo courtesy of Stuart Healy

Northern Long-eared Myotis (bat)
Photo courtesy of Tim Carter

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1 Overview

Cascadia Natural Resource Consultants (Cascadia) in cooperation with Tolko Industries Ltd. Heffley Creek division and Canfor have developed a Species at Risk (SAR) database application to assist licensees in the Kamloops, Merritt and Okanagan TSA's make informed decisions regarding sensitive wildlife habitats and Species at Risk during strategic and operational planning exercises.

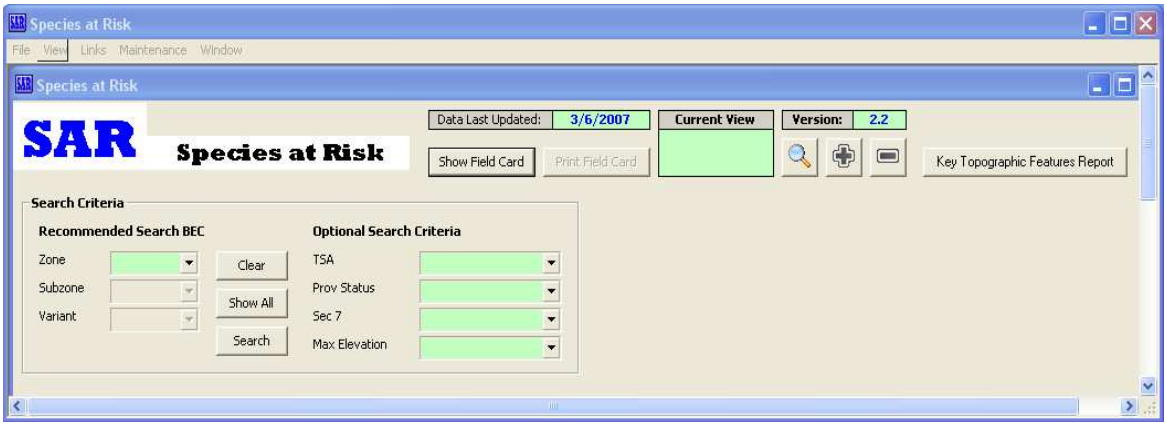
The application allows users to navigate through the custom SAR database and identify species at risk in by unique BEC zones and other criteria. Navigation results can be viewed in their entirety or as Field Card Reports of key SAR attributes for each BEC Variant in a TSA.

Cascadia Natural Resource Consultants have been identified as the initial data custodian for the SAR database and will be active in updating the SAR database annually for TSA users.

To meet both of these needs the application is deployed two modes;

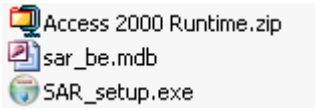
- Read only for the general user base and;
- Read / Write / Delete for the data custodian (password protected).

SAR Version 2.2 has been developed to address a number of recommendations made since the initial user workshop held in October 2006 and to update the application to allow server installation of the backend database permitting a single instance of the data source in networked environments.

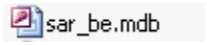


2 Installation

Installation files:



2.1 DATA BASE INSTALLATION OPTIONS



The SAR v2.2 application is a Microsoft Visual Basic application utilizing an MS Access data store. The modular design of the applications will allow the application to be installed on a single PC or on many PC's in a networked environment.

In a single PC install the SAR data store (**sar_be.mdb**) must be copied to a location on the local PC. Once installed, SAR will request the use to connect to the data store in a one time operation. In the network installation the SAR back end data store is placed on a network server location accessible by all PC's running the SAR application. Once installed on any given networked PC, SAR will request the use to connect to the data store in a one time operation.

2.1.1 Installing on a single PC

1. 1. Create a folder on your local machine
   example: **SAR Database**
2. Copy the sar_be.mdb to the new data base folder
3. Follow the SAR installation instructions.
   It is recommended that the SAR application be installed under the standard Windows 'Program Files' directory.

2.1.2 Installing on a multiple PC's – Single database instance

1. 1. Create a folder on your network server that is accessible by all machines running the SAR application.
   example: **SAR Database**
2. Copy the sar_be.mdb to the new data base folder
3. Follow the SAR installation instructions.
   It is recommended that the SAR application be installed under the standard Windows 'Program Files' directory.

2.2 SYSTEM REQUIREMENTS

Minimum Requirements:

- Operating System: Windows 2000 or better
- Applications: MSAccess 2000 or better or Microsoft Access 2000 Runtime

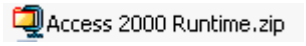
The application has been designed to run on systems that may or may not have MS Access 2000 (or better) installed locally.

If you do not have MS Access 2000 (or better) installed locally proceed to **2.3 Installing Microsoft Access 2000 runtime**.

If you have MS Access 2000 (or better) installed on your local machine proceed to **2.4 Installing SAR v2.2**

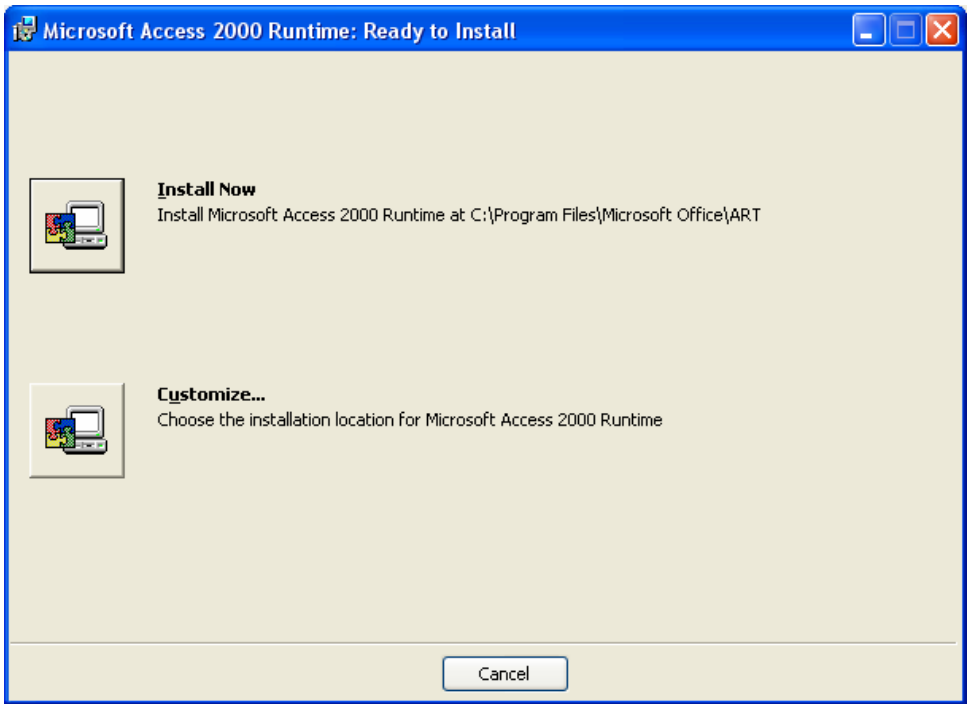
2.3 INSTALLING MICROSOFT ACCESS 2000 RUNTIME

Microsoft 2000 Runtime support has been delivered in a zip file format.



To install:

4. Unzip the Access 2000 Runtime .zip to a temporary location on your local machine
5. Navigate to the …..*temp folder*\Access 2000 Runtime\min location where the zip file was extracted and select **setup.exe**
6. On the installation screen select **Install Now** and follow the remaining prompts


Microsoft Access 2000 Runtime: Ready to Install
Install Now
Install Microsoft Access 2000 Runtime at C:\Program Files\Microsoft Office\ART
Customize...
Choose the installation location for Microsoft Access 2000 Runtime
Cancel

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2.4 INSTALLING SAR V2.2

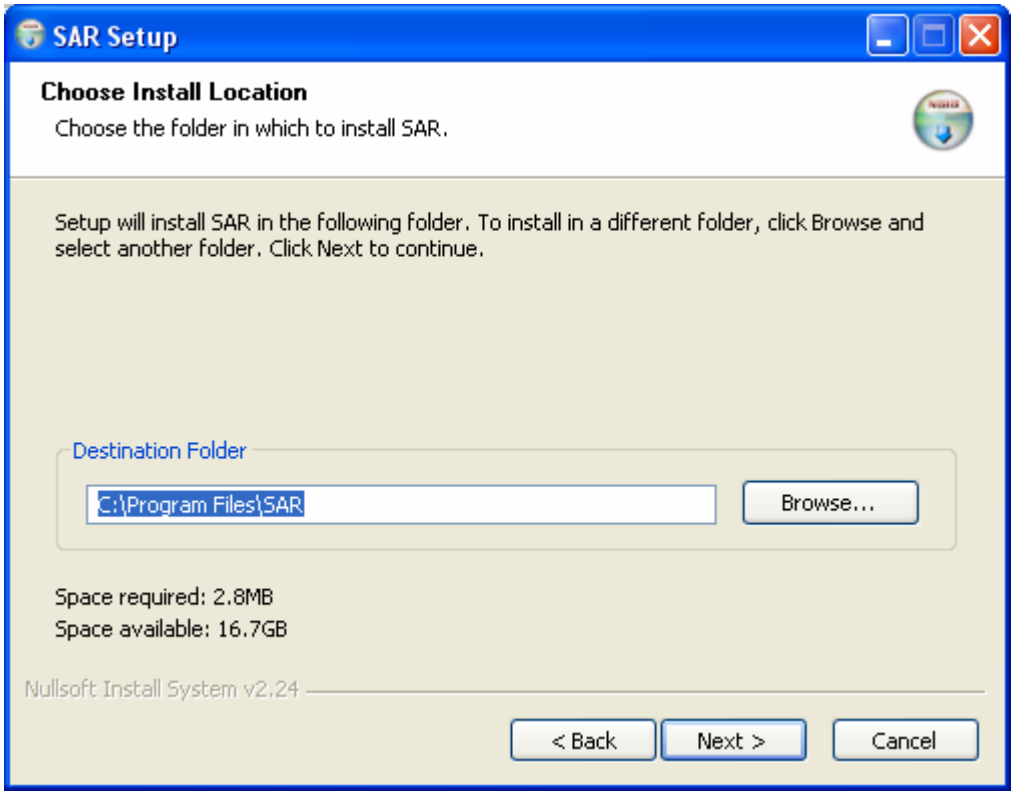
The SAR v2.2 data base application is delivered in an installation package called **SAR_setup.exe**. The back end database is delivered

SAR_setup.exe

To install SAR v2.2:

1. Create a folder on your Copy the **SAR_setup.exe** file to a location on your local machine
2. Double click the SAR_Installer.exe and follow the prompts using the **Next** button
   Use the following settings for optimum installation.
3. Select **Install** after confirming install location and start menu folder.
   Once the installation has completed select **Next**

   Install Location:


SAR Setup
Choose Install Location
Choose the folder in which to install SAR.
Setup will install SAR in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.
Destination Folder
C:\Program Files\SAR
Browse...
Space required: 2.8MB
Space available: 16.7GB
Nullsoft Install System v2.24
< Back
Next >
Cancel

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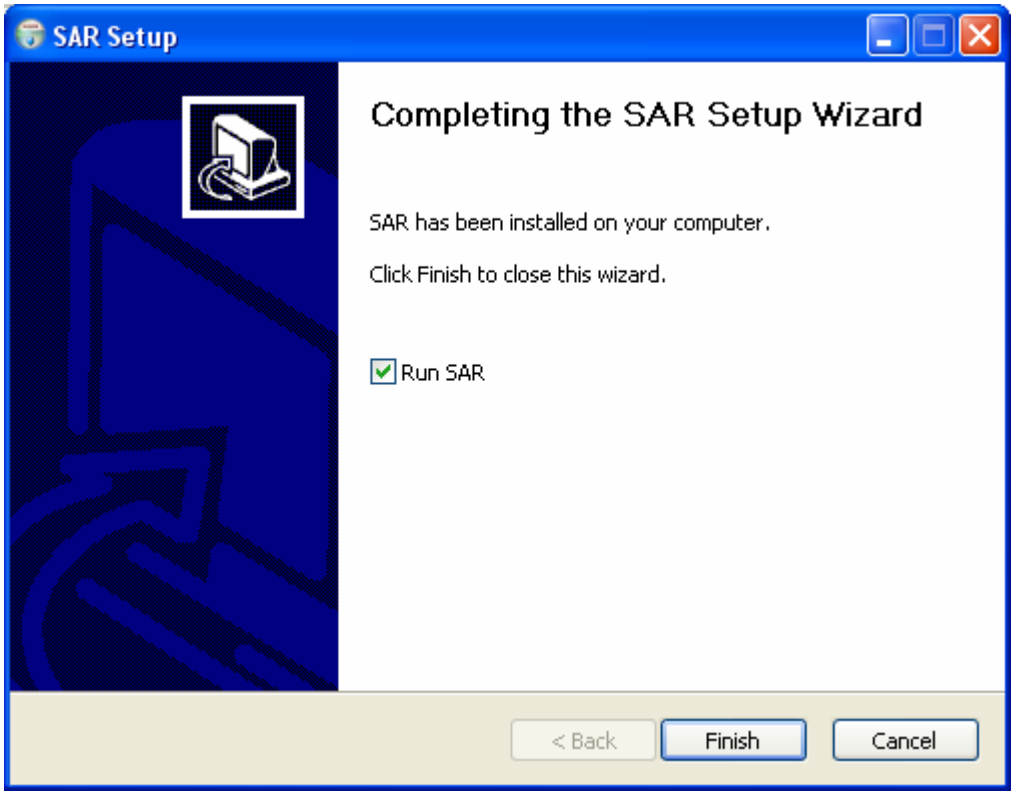
4. On the SAR Setup Completion screen select Finish.
   Note: The Run SAR check box is selected by default. Selecting Finish will start the SAR application and prompt you to connect to the SAR data store

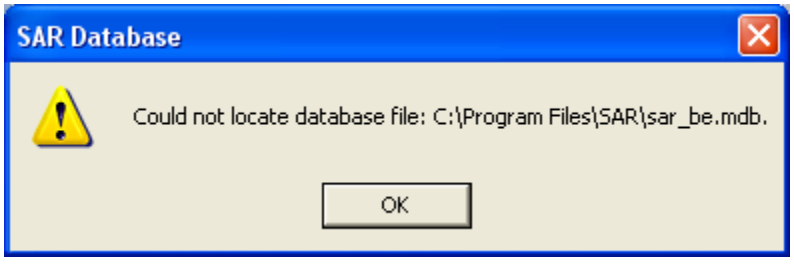
Once installed SAR v2.2 will be available from your Windows Start Menu and a desktop Icon.



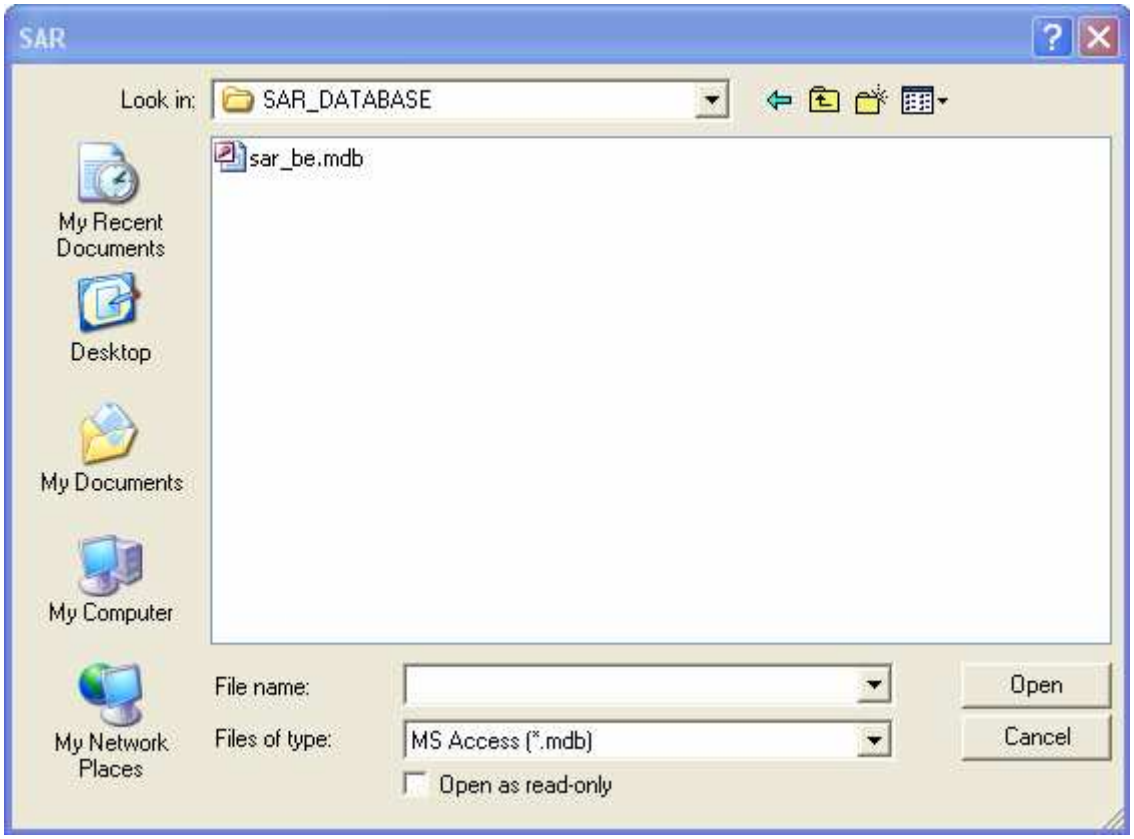
2.4.1 Connecting to the SAR Data Store

On your initial startup, the SAR v2.2 the application will attempt to locate the SAR Data Store (sar_be.mdb) and display the following message

1. Select **OK** to locate the SAR Data Store



2. Navigate to the SAR Data Store location on your local PC or network server and select the sar_be.mdb



- **Note 1:** For network data Store installations each PC with a new install of SAR will be required to connect to the centrally located sar_be.mdb.
- **Note 2:** If the sar_be.mdb is removed or deleted from the initial location on your PC or server the SAR application will ask you to located the sar_be.mdb data base when the SAR application is started.

2.5 REPLACING THE MSACCESS DATA STORE

Periodically the data custodian will release an updated SAR database. To update your SAR database simply copy the new **SAR_be.mdb** to the SAR Data Store location on your local PC or network server overwriting the previous database instance.

- **Note:** Some users may want to archive the previous SAR_be.mdb database prior to replacing it with the new database.

2.6 CHANGING THE SAR DATA STORE LOCATION

You may change the local or network server location of the SAR Data Store by following these steps:

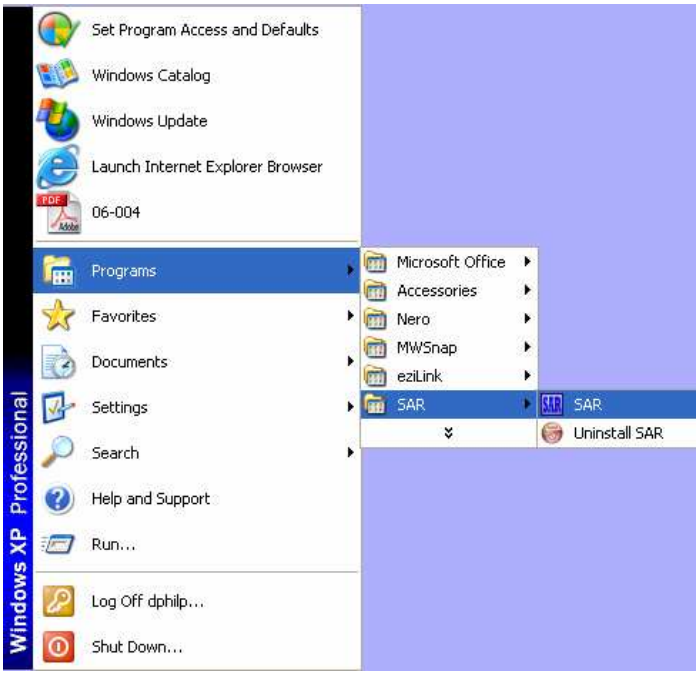
1. Copy the sar_be.mdb file to a new location on your local PC or network server
2. Delete the sar_be.mdb from it's previous location
3. Start the SRA v2.0 application.
4. Follow the steps in section 2.4.1 Connecting to the SAR Data Store above

3 SAR – Species At Risk

3.1 LAUNCHING SAR

To open the SAR database:

1. Select the Windows Start Menu Programs Group
2. Select the **SAR Database** from the SAR Program Group



3.2 NAVIGATION

Navigation in the SAR database is contained in a single navigation interface.

The interface contains standard windows controls for drop down selection, window scrolling, minimize, maximize and close.

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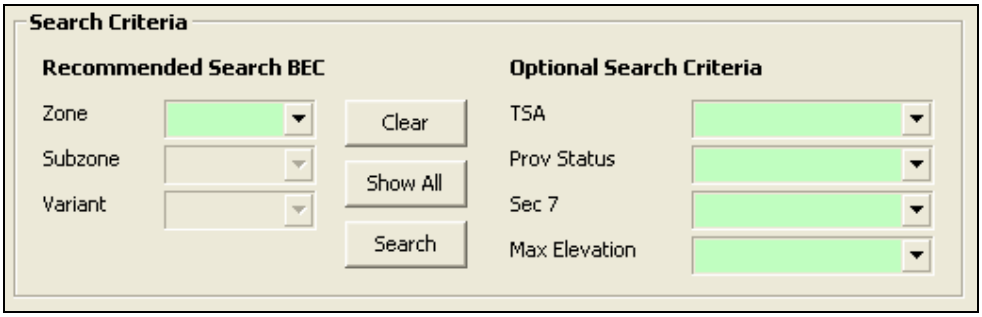
3.3 SEARCHING THE DATABASE

3.3.1 Search Criteria

Searching for Species at Risk is achieved through primary and secondary or optional search criteria. The primary search criteria are BioGeoClimatic (BEC) zone, sub-zone and variant. The secondary search criteria are TSA, Species at Risk Provincial Status, Sec 7 Notification and Maximum Elevation.

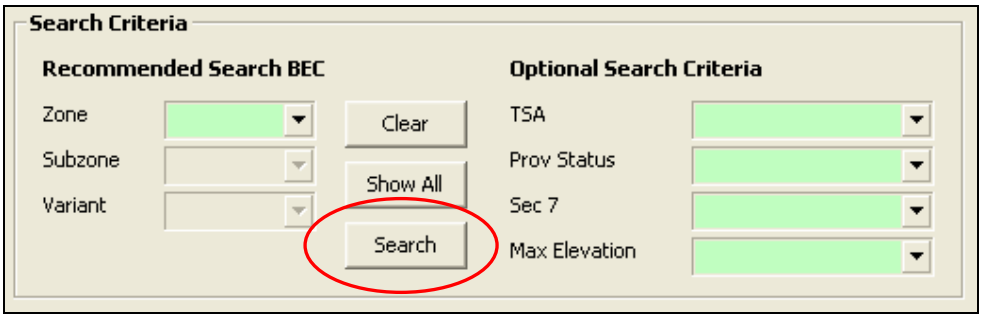


Note: The data base has been modeled to allow only valid BEC zone, sub-zone and variant combinations.

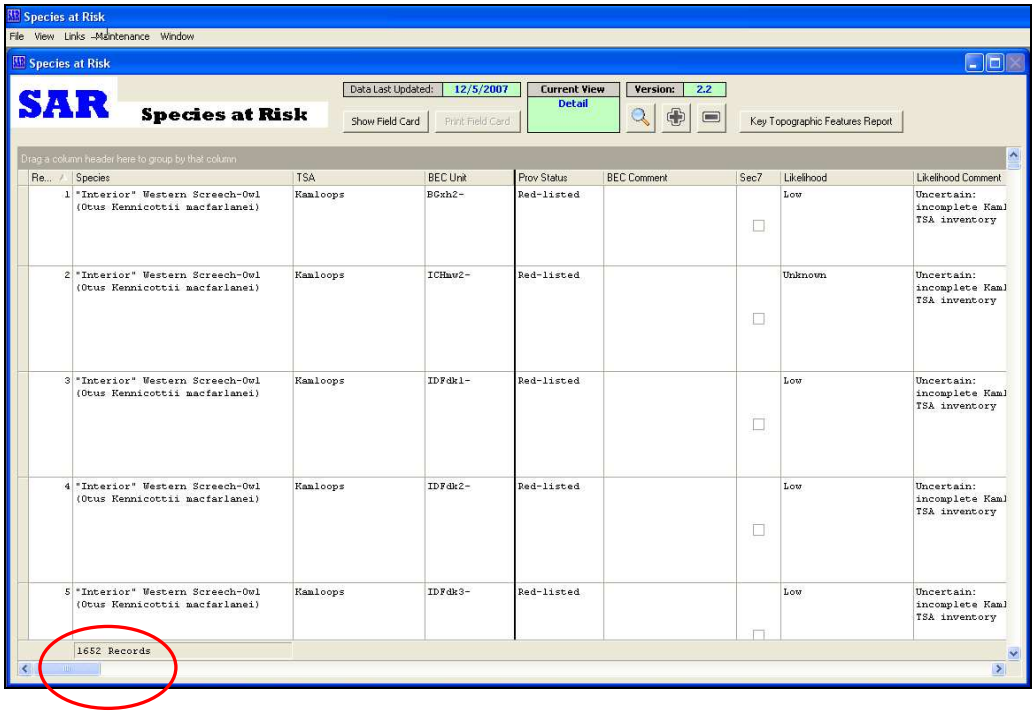
3.3.2 Retrieving all SAR Database Records

To Retrieve all SAR Records:

1. Select the **Search** button without selecting primary or optional search criteria



This search will return the entire contents of the database in a display grid

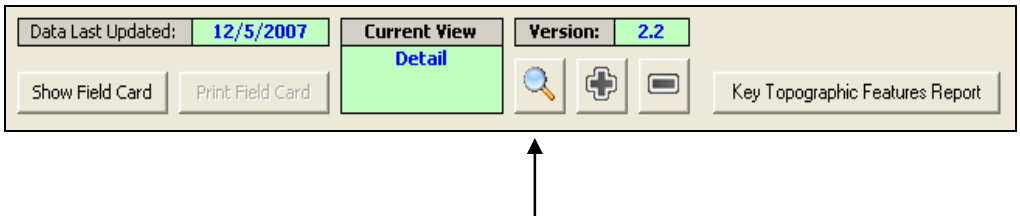

Species at Risk
File View Links Maintenance Window
Species at Risk
SAR
Species at Risk
Data Last Updated: 12/5/2007
Current View
Detail
Version: 2.2
Show Field Card
Print Field Card
Key Topographic Features Report
Drag a column header here to group by that column
Re... / Species TSA BEC Unit Prov Status BEC Comment Sec7 Likelihood Likelihood Comment
1 "Interior" Western Screech-Owl (Otus Kennicottii macfarlanei) Kamloops BGxh2- Red-listed Low Uncertain: incomplete Kaml TSA inventory
2 "Interior" Western Screech-Owl (Otus Kennicottii macfarlanei) Kamloops ICHmw2- Red-listed Unknown Uncertain: incomplete Kaml TSA inventory
3 "Interior" Western Screech-Owl (Otus Kennicottii macfarlanei) Kamloops IDFdk1- Red-listed Low Uncertain: incomplete Kaml TSA inventory
4 "Interior" Western Screech-Owl (Otus Kennicottii macfarlanei) Kamloops IDFdk2- Red-listed Low Uncertain: incomplete Kaml TSA inventory
5 "Interior" Western Screech-Owl (Otus Kennicottii macfarlanei) Kamloops IDFdk3- Red-listed Low Uncertain: incomplete Kaml TSA inventory
1652 Records

Note: The total number of records returned is displayed in the bottom left of the application window.

Executing a Search minimizes the search criteria panel when records are returned. This is done to maximize screen real estate.

To re-open the Search Criteria panel:

1. Select the **Search** icon from the main SAR panel.



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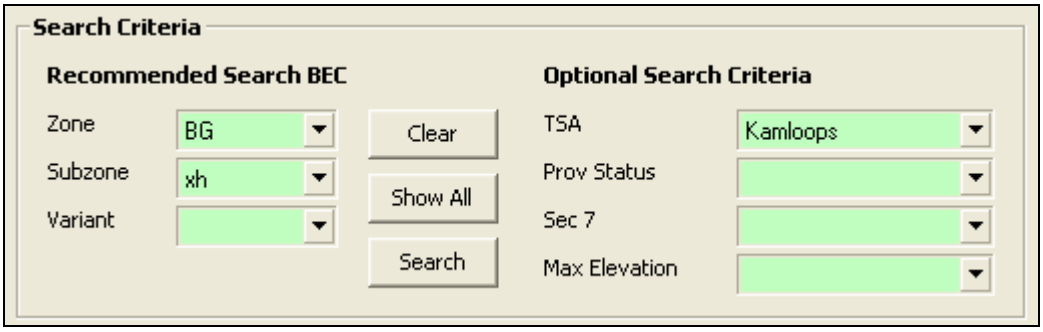
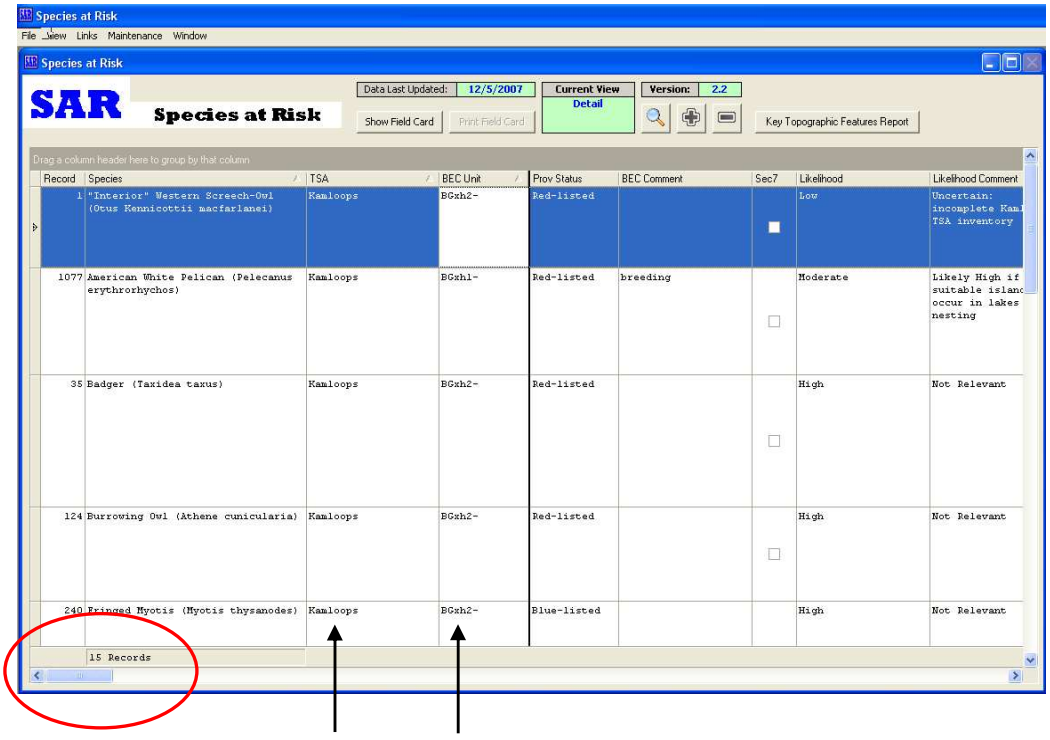
3.3.3 Retrieving Selected SAR Database Records by Search Criteria

To retrieve selected SAR Records:

1. Select the desired Search Criteria using the dropdowns for Recommended Search BEC and Optional Search. Any combination of criteria can be used.



2. Select the **Search** button. Results will be displayed in the display grid.


Species at Risk
File View Links Maintenance Window
SAR
Species at Risk
Data Last Updated: 12/5/2007
Current View
Detail
Version: 2.2
Show Field Card
Print Field Card
Key Topographic Features Report
Drag a column header here to group by that column
Record
Species
TSA
BEC Unit
Prov Status
BEC Comment
Sec7
Likelihood
Likelihood Comment
1 "Interior" Western Screech-Owl (Otus Kennicottii macfarlanei) Kamloops BGxh2- Red-listed Low Uncertain: incomplete Kam TSA inventory
1077 American White Pelican (Pelecanus erythrorhychos) Kamloops BGxh1- Red-listed breeding Moderate Likely High if suitable islan occur in lakes nesting
35 Badger (Taxidea taxus) Kamloops BGxh2- Red-listed High Not Relevant
124 Burrowing Owl (Athene cunicularia) Kamloops BGxh2- Red-listed High Not Relevant
240 Fringed Myotis (Myotis thysanodes) Kamloops BGxh2- Blue-listed High Not Relevant
15 Records

In the example above 15 records were returned meeting the selected criteria.

Note that the returned records include BEC zone and sub-zone as per the criteria. All variants were returned as well as there was no variant specified in the search.

3.3.4 Clearing a Search

To clear a search:

1. Select the **Clear** button located on the Search Criteria panel. Clearing the search will remove all criteria from the Search Criteria panel and remove the record display grid.
2. Individual criteria can be removed by highlighting the field with the cursor and selecting **Delete** from the keyboard.

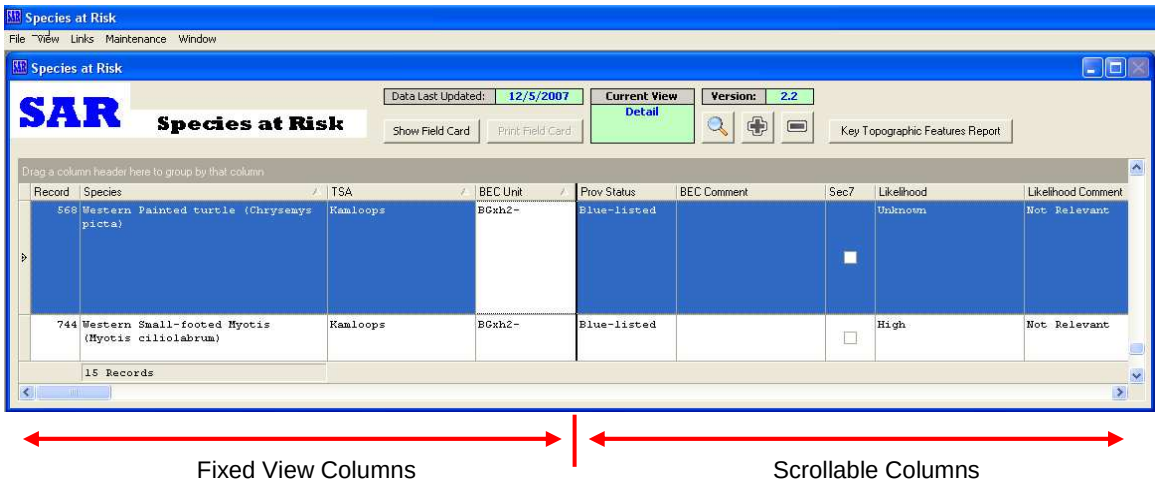
3.4 DISPLAY GRID DATA VIEWS

3.4.1 Fixed vs. Scrollable Data Columns

In all display modes the SAR data base display grid has fixed and scrollable horizontal data columns. The key SAR entities are displayed in the fixed columns. All other SAR attributes are displayed in the horizontal scrollable columns. This configuration maintains the key SAR entities in the view for species and location identification. All columns scroll vertically.

Key SAR entities:

- Record (System)
- Species (Common and Latin names)
- TSA
- BEC Unit



3.4.2 Current View

The SAR data base display grid can display database records in 2 modes;

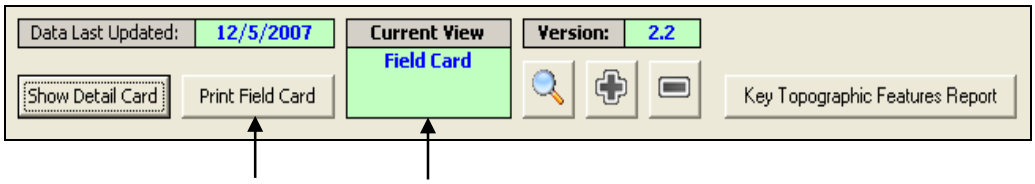
- Details
- Field Card

The Details view displays all data columns for records displayed in current view. The SAR Field card view is a specific subset of the SAR database columns implemented to assist planners and biologists in the field.

The Details view is the default display mode.

To switch to Field Card view:

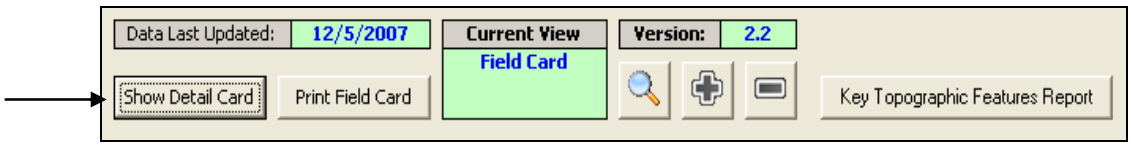
1. Select **Show Field Card**
   the Current View display will change to Field Card. Note that the Print Field Card Button becomes active in Field Card View and the current view changes to Field Card.



Note: If a record in the grid has been selected prior to selecting Show Field Card, only the selected record will display in Field Card View. Use **Ctrl/Click** to deselect records

To switch to Details view:

2. Select **Show Detail Card**
   the Current View display will change back to Details.



Note: Clearing the search and re-querying the SAR records will reset the current view to Details.

3.4.3 Display Grid Properties

The Display Grid has three distinct properties for altering the data view

- Ascending Sort
- Column Order
- Drag and Drop Grouping

Ascending/Descending Sort

Each column can be sorted in an ascending/descending alphabetical or numeric order.

Only one column can be sorted. Sorts cannot be combined across columns

To sort a column:

1. Use your left mouse button and single click a column header. The sort will alternate between ascending and descending order.

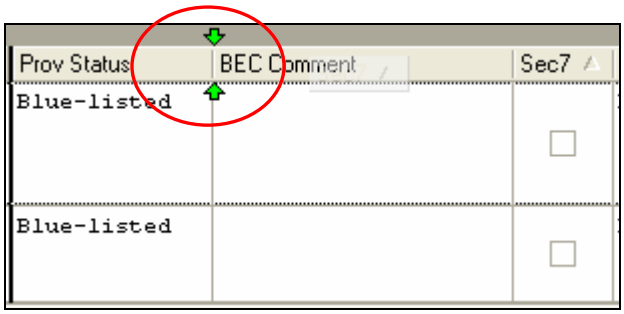
Column Order

Column order can be modified by simply selecting the column header and moving it to a new location in the grid.

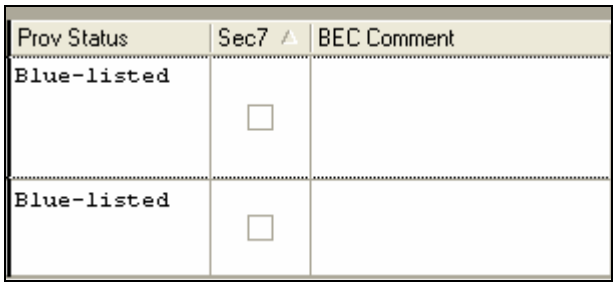
To reposition a column in the grid:

1. Use your left mouse button to select the column header to move
2. Drag the column header to the new location as indicated by the yellow placement arrows
3. Release the mouse button

In the following example, **Sec 7** is currently selected for repositioning in the Grid. As your cursor drags the column header across the header portion of the grid yellow arrows appear at each location that will accept the column header placement.



Sec 7 has been successfully moved to a new position in the grid.



Note: Clearing the search and re-querying the SAR records will reset the column order to the default order.

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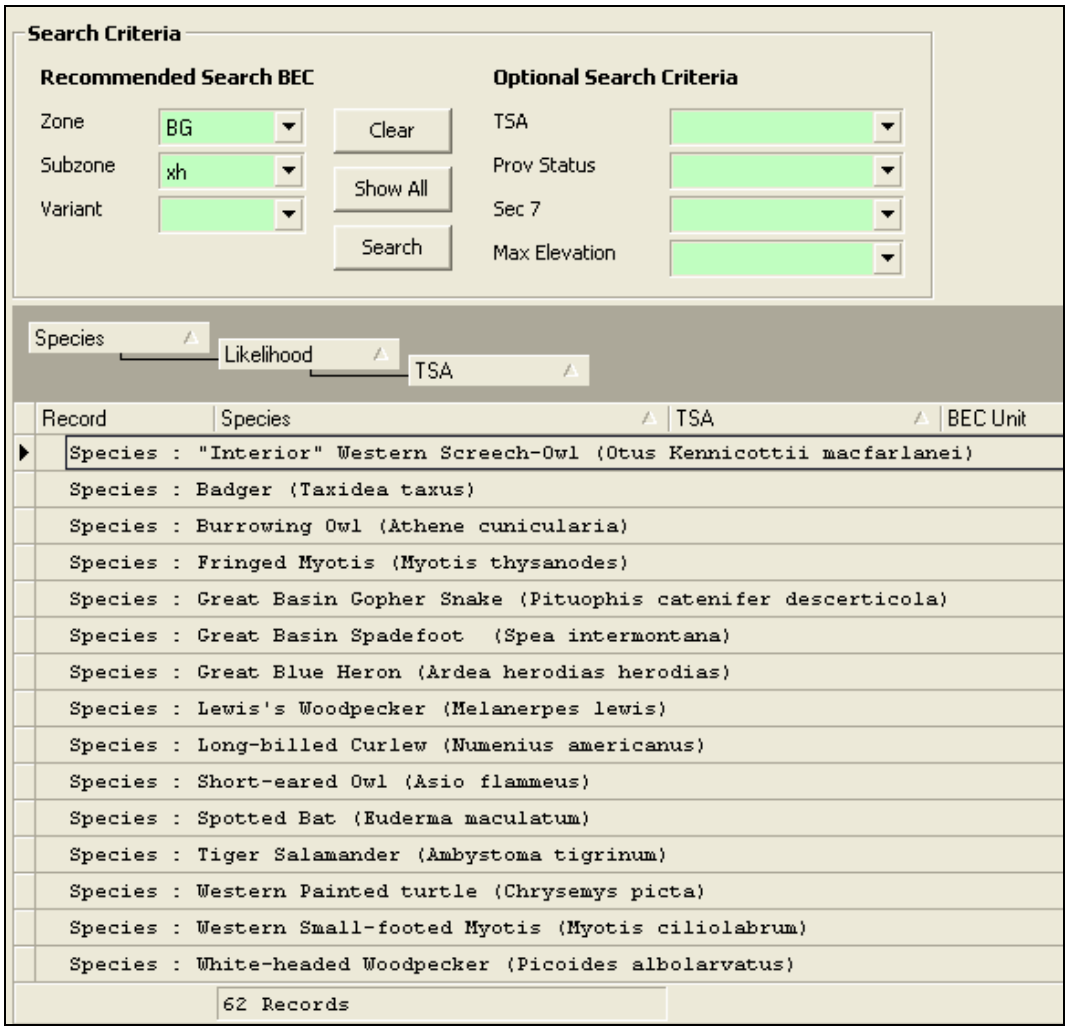
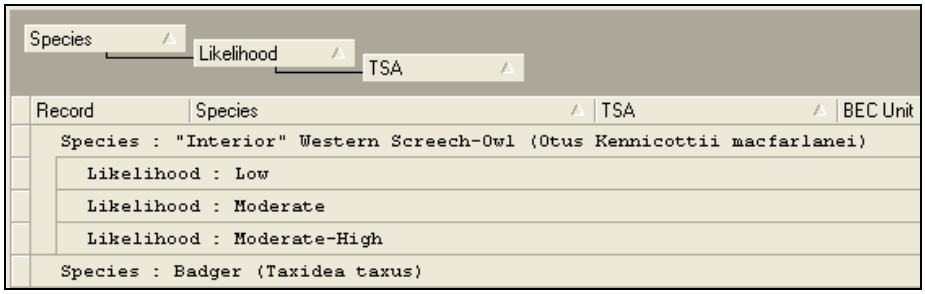
Drag and Drop Grouping

Drag and Drop Grouping allows the data grid to be arranged in a summarized, hierarchical tree structure. This is an extremely powerful data viewing function that allows any data element in the SAR data base to become the focus or primary data element in view.

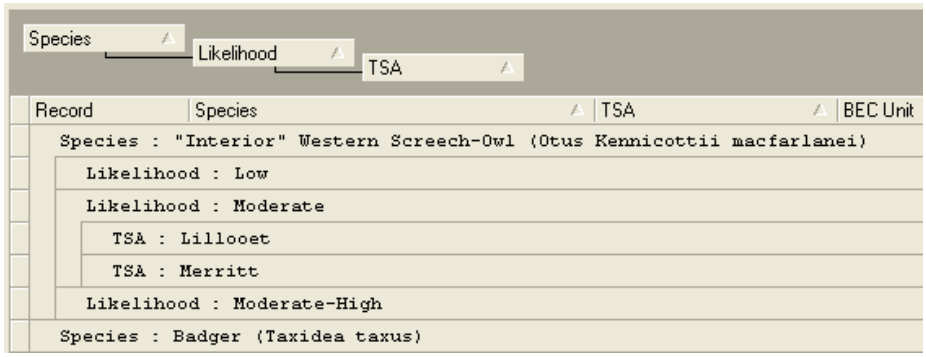
In the following example the SAR databases has been searched with specific criteria resulting in 62 records returned. The **Species**, **Likelihood** and **TSA** columns have been grouped summarizing each grouped column by grouping level. In this example Species resides at the highest grouping level the resulting grid display shows only one occurrence of each species returned by the search criteria. As an example the species, “Interior Western Screech-Owl” appears only once in the grid.



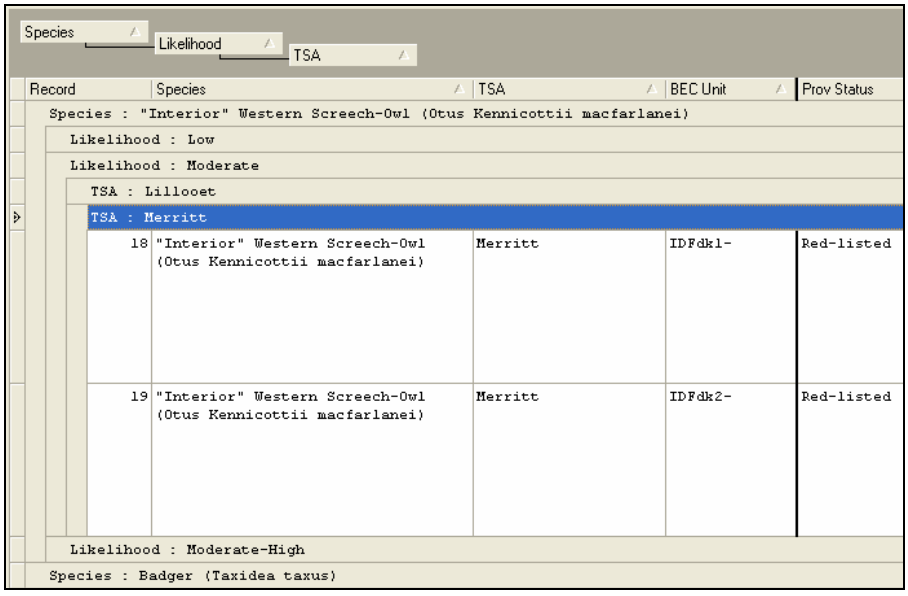
Double clicking a single species reveals the next group item, Likelihood. In this example there are three likelihood categories available indicating the there at least three distinct "Interior Western Screech-Owl" records in the SAR database that matched the search criteria.



Double clicking the Likelihood: Moderate indicator drills down further and reveals that the "Interior Western Screech-Owl" has a moderate likelihood of being present in the Lillooet and Merritt TSA.



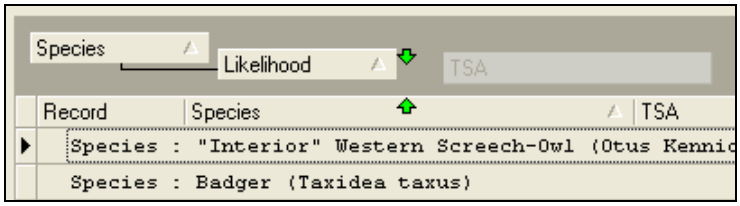
The lowest level of the example grouping is TSA. Double clicking a TSA indicator reveals all remaining columns not included in the grouping.



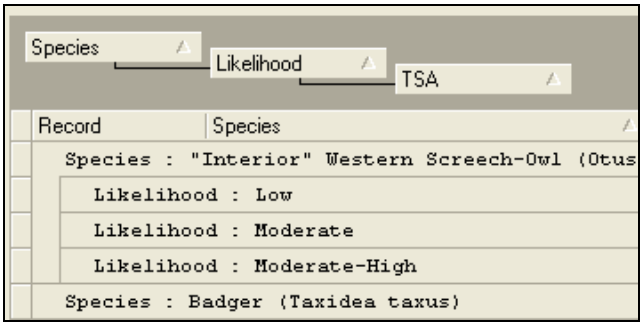
Note: There is no limitation to the number or order of columns in the group.

To create a Data Group:

1. Use your left mouse button to select the column header to group
2. Drag the column header to the drag an drop location in the grid



3. Release the mouse button to add the column header to the grouping.



4. Repeat for the desired columns

Note: Clearing the search and re-querying the SAR records will remove the Data Group and reset the grid order to the default order.

3.5 REPORTS

3.5.1 Field Card Report

The Field Card view can be printed to a formatted report containing a single or multiple SAR record sets.

To print a single SAR record set:

1. Use the **Search** functionality to locate SAR records of interest
2. Use your left mouse button to select the record(s) to print. The record(s) can be selected anywhere in the grid
3. Select **Show Field Card** to switch to Field Card View
   The Current View display will change to Field Card and only the selected record will display.
4. Select **Print Field Card**
   See Appendix A for sample Field Card report
5. Select the printer icon from the Field Card Report window to send the report to your local printer.

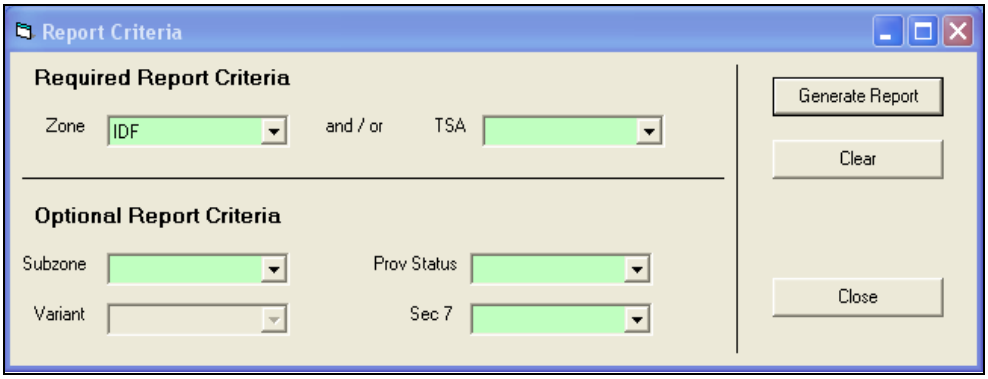
3.5.2 Key Topographic Features Report

The Key Topographic Features Report has been designed to provide critical attributes from the database to support Species at Risk assessment required under FRPA for forest operations. This report provides quick access to common habitat attributes and management strategies by BEC Unit and TSA allowing forest technicians to focus in on those habitat attributes during planning to ensure the appropriate management strategies are addressed.

To generate the Key Topographic Features report:

6. Select the Key Topographic Report button bar from the main SAR page

7. Select the desired search criteria in the report criteria dialog. You must select at least one required criteria to generate the report. Selection of optional report criteria requires the selection of at least one required criteria.



8. Select Generate Report to create the report.
9. Select the printer icon from the Key Topographic Report window to send the report to your local printer. See Appendix B for sample Key Topographic Features Report
10. Select Close to close the Key Topographic Report search panel.

3.5.2.1 Clearing Report Criteria

To clear a search:

1. Select the **Clear** button located on the Search Criteria panel. Clearing the search will remove all criteria from the Key Topographic Report search panel.
2. Individual criteria can be removed by highlighting the field with the cursor and selecting **Delete** from the keyboard.

3.6 DATABASE VERSION

3.6.1 Date last Updated

The Date Last Updated displays the last SAR Database edit date. Periodically the data custodian will release an updated SAR database. Once the update database has replaced the previous database the new date of the last database update will be displayed.

3.6.2 SAR Version

The Version displays the current SAR application Version

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3.7 MENU & FUNCTIONS

3.7.1 File Menu

The file menu contains a generic Print function and Exit. At present the Print function only allows for printing of the entire database. Users will find this problematic in that the page size required to print all fields exceeds that of most desktop printers. The Print function may be enhanced in future releases.

3.7.2 View Menu

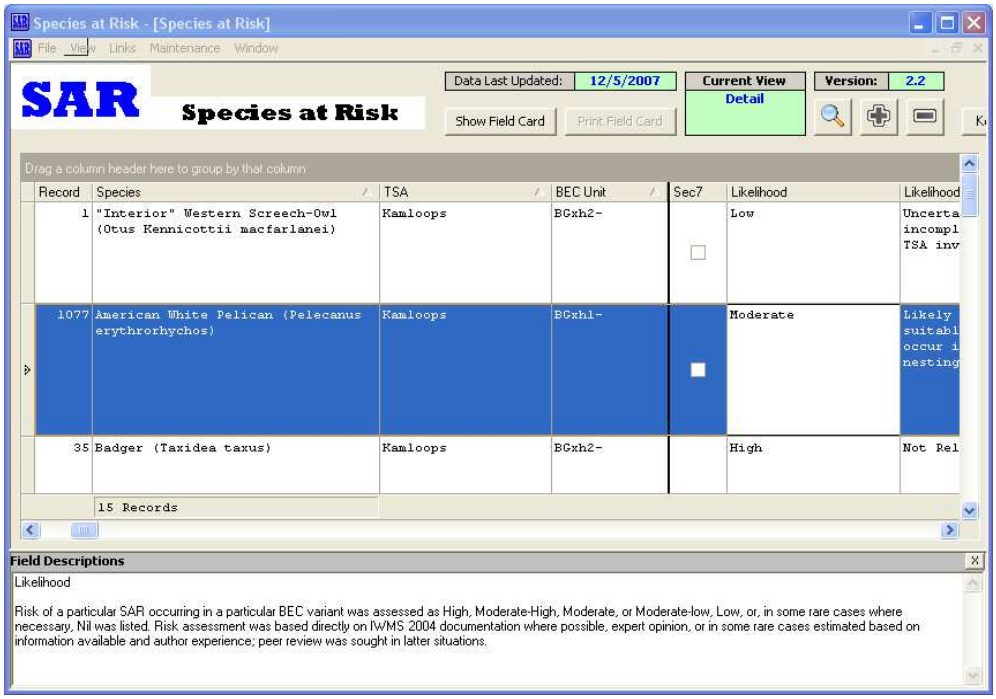
The view menu has three functions; **Detail**, **Field Card** and **Show Field Descriptions**.

Detail / Field Card

Detail and Field Card are toggles that can be used to switch between Details and Field Card views of the data grid. These functions will automatically execute a global database search if there the data grid is not displayed.

Show Field Descriptions

The Show Field Descriptions menu item activates the field descriptions display in the SAR application interface


Species at Risk - [Species at Risk]
File View Links Maintenance Window
SAR
Species at Risk
Data Last Updated: 12/5/2007
Current View
Detail
Version: 2.2
Show Field Card
Print Field Card
Drag a column header here to group by that column
Record
Species
TSA
BEC Unit
Sec7
Likelihood
1 "Interior" Western Screech-Owl (Otus Kennicottii macfarlanei) Kamloops BGxh2- Low
1077 American White Pelican (Pelecanus erythrorhychos) Kamloops BGxh1- Moderate
35 Badger (Taxidea taxus) Kamloops BGxh2- High
15 Records
Field Descriptions
Likelihood
Risk of a particular SAR occurring in a particular BEC variant was assessed as High, Moderate-High, Moderate, or Moderate-low, Low, or, in some rare cases where necessary, Nil was listed. Risk assessment was based directly on IWMS 2004 documentation where possible, expert opinion, or in some rare cases estimated based on information available and author experience; peer review was sought in latter situations.

Each field in the SAR database application has metadata that describes the purpose and content of the field.

This feature can be toggled on and off using from the View menu or by using the F1 key.

3.7.3 Links Menu

The Links menu provides hot links to four key BC Ministry of Environment Species at Risk websites under 2 categories

MOE

- BC Species and Ecosystem Explorer
- WHA - Approved Wildlife Habitat Areas

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Sightings

- Frog Watch
- CDC Data Contribution

3.7.4 Maintenance Menu

The Maintenance mode menu provides access to the editing functions in the SAR database. This functionality is password protected. See the SAR Administrator Manual v2.0 for detailed information.

3.7.5 Window Menu

The Window menu displays all opens forms. This function is standard Windows menu item.

3.7.6 Search

The Search button displays and hides the Search Criteria panel.

3.7.7 Add Record

The Add Record button adds a new record to the SAR database. This function is available in Maintenance mode only.

3.7.8 Delete Record

The Delete Record button permanently removes a record from the SAR database. This function is available in Maintenance mode only.

Appendix A. Field Card Report Example

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Example on next page

SAR Species at Risk

FIELD CARD

Species	**Great Basin Spadefoot (Spea intermontana)**
Prov Status	**Blue-listed**
TSA	**Kamloops**
BEC Unit	**IDFxh2-**
Likelihood	**Moderate**
Sec 7	☐

Feature Identifiers

Soil moisture regime	**Lead species**
Hydric, Hygric, Sub-hygric, Mesic, Xeric	Unknown
Slope range	**Crown closure**
0-15	<30%
Age class	**Critical aspect 2**
Unknown	W ()
Sub-dominant species	**Structural stage**
Py	1-7
Critical aspect 1	**Co-dominant species**
S, SE, SW ()	Py
Key microsite topo features	
Shallow and ephemeral water: River/Stream, Flooded land, Lake, Pond	

Management Guide

Clear cut or partial cut	**Patch species retention**
Partial cut	Unknown
Single tree retention species	**Patch retention size**
Not Available	250m core incl aquatic breeding and suitable upland
Single tree retention size	**Stand structure for retention**
Not Available	open parkland
Buffer around single tree	**Stand density for retention**
Not Available	Open
Wildlife tree class	**Key stand features for retention**
8-9	Uncompacted soils adjacent/nearby aquatic systems, CWD and vets (CWD recruitment)

Additional Management Considerations
Confirm breeding by tadpole identification in Jun-Jul; breeding typically < 600m elevation, aquatic habitat; foraging and hibernation in xeric, upland sites; frequent valley bottoms.

Appendix B. Key Topographic Features Report Example

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Example on next page

SAR Species at Risk

Key Topographic or Distinguishing Features

Report Criteria

TSA:	Kamloops	**Prov Stat:**	
BEC:	IDF xh	**Sec7**	

Species	Prov Status	Key Stand Features	Crown Closure	Critical Aspect 1	Slope Range	Age Class	Topographic or Distinguishing Feature	Min Elevation	Max Elevation	Lead Species	Additional Management Considerations	Likelihood
"Interior" Western Screech-Owl (Otus Kennicottii macfarlanei)	Red-listed	Large diameter trees in riparian forest, particularly with cavities, incl Act, At, Ew and mixed conif-decid, large snags, shrub understory	<75%	N/A	Not Applicable	4-9	River/stream	0	1000	Act, At, Fd	Consider nesting requirements of Pileated and Northern Flickers since woodpecker holes are most commonly used for roosting; most occupied territories have at least 2 cavities (nesting & roosting)	Moderate
"Interior" Western Screech-Owl (Otus Kennicottii macfarlanei)	Red-listed	Large diameter trees in riparian forest, particularly with cavities, incl Act, At, Ew and mixed conif-decid, large snags, shrub understory	<75%	N/A	Not Applicable	4-9	River/stream	0	1000	Act, At, Fd	Consider nesting requirements of Pileated and Northern Flickers since woodpecker holes are most commonly used for roosting; most occupied territories have at least 2 cavities (nesting & roosting)	Moderate
"Interior" Western Screech-Owl (Otus Kennicottii macfarlanei)	Red-listed	Not Applicable	Not Applicable	N/A	Not Applicable	Not Applicable	River/stream	0	1000	Act, At, Fd	Consider nesting requirements of Pileated and Northern Flickers since woodpecker holes are most commonly used for roosting; most occupied territories have at least 2 cavities (nesting & roosting)	Moderate
American White Pelican (Pelecanus erythrorhychos)	Red-listed	Riparian/wetland vegetation/forest that provides isolation to aquatic system	Not Applicable	Not Available	Flat	Not Applicable	Slow flowing aquatic systems, lakes with islands			Not Applicable	No traffic (vehicular or aircraft) near, on, in, or over lakes/aquatic systems used for nesting, foraging, loafing/roosting (no roads within 1-8km of foraging lakes-consult MoE where foraging is confirmed); no change in water levels; Apply largest reserve	Moderate
American White Pelican (Pelecanus erythrorhychos)	Red-listed	Riparian/wetland vegetation/forest that provides isolation to aquatic system	Not Available	Not Available	Flat	Not Applicable	Slow flowing aquatic systems, lakes with islands			Not Applicable	No traffic (vehicular or aircraft) near, on, in, or over lakes/aquatic systems used for nesting, foraging, loafing/roosting (no roads within 1-8km of foraging lakes-consult MoE where foraging is confirmed); no change in water levels; Apply largest reserve	Moderate
American White Pelican (Pelecanus erythrorhychos)	Red-listed	Riparian/wetland vegetation/forest that provides isolation to aquatic system	Not Available	Not Available	Flat	Not Applicable	Slow flowing aquatic systems, lakes with islands			Not Applicable	No traffic (vehicular or aircraft) near, on, in, or over lakes/aquatic systems used for nesting, foraging, loafing/roosting (no roads within 1-8km of foraging lakes-consult MoE where foraging is confirmed); no change in water levels; Apply largest reserve	Moderate
American White Pelican (Pelecanus erythrorhychos)	Red-listed	Riparian/wetland vegetation/forest that provides isolation to aquatic system	Not applicable; avoid road construction	Not Available	Flat	Not applicable; avoid road construction	Slow flowing aquatic systems, lakes with islands			Not applicable; avoid road construction	No traffic (vehicular or aircraft) near, on, in, or over lakes/aquatic systems used for nesting, foraging, loafing/roosting (no roads within 1-8km of foraging lakes-consult MoE where foraging is confirmed); no change in water levels; Apply largest reserve	Moderate
American White Pelican (Pelecanus erythrorhychos)	Red-listed	Riparian/wetland vegetation/forest that provides isolation to aquatic system	Not Available	Not Available	Flat	Not Applicable	Slow flowing aquatic systems, lakes with islands			Not Applicable	No traffic (vehicular or aircraft) near, on, in, or over lakes/aquatic systems used for nesting, foraging, loafing/roosting (no roads within 1-8km of foraging lakes-consult MoE where foraging is confirmed); no change in water levels; Apply largest reserve	Moderate